

THE DETERMINANTS AND STRUCTURE OF DOMESTIC ENERGY CONSUMPTION IN SAKI, OYO STATE. NIGERIA.

¹Oderinde, M. O, ²Sulola, M. A, ³Amao, A. O.

^{1,2,3} Department of Mechanical Engineering The Oke-Ogun Polytechnic Saki, Oyo State.

Correspondence: sulola.lanre@gmail.com

ABSTRACT

Energy as the major means of man's survival occupies a crucial position in the nation's economy. In order for people to survive, they fall into different structures based on the location, source of energy available in their domains and their financial capacity. The research reveals that substantial amount of family incomes is spent on energy. This promotes investigation into the structure of energy and their sources for proper future planning. The study was carried out under the structured questionnaire, which carries information on the energy source and the time for heating, cooking, entertainment, refrigeration, etc, for a specific family in each zone and the reasons for adopting their choice source. The outcomes of the research show that 91.21% of houses use charcoal, 76.92% of houses use electricity, 76.27% responded to kerosene, 71.43% responded to petrol, 15.93% to diesel, 21.43% to fuel wood, 19.78% to LNG and approximately 0% response to solar. The structure shows that the vegetation of Saki, is under threat as a result of too much deforestation, where the major source comes from this results into environmental problem, air pollution and desertification. The study also considered factors responsible for various choices of energy. The data obtained from this research can be used in calculating total energy needed by Saki per day. Once the number of houses is known, this can be used for future energy planning.

Keywords: Biomass, Electricity, Desertification of Environments, Air pollution and Deforestation

INTRODUCTION

The major problems of African nations are lack of proper analysis on the suitable sources of energy to be used. People embark on any source of energy without considering the environmental implications. Though, energy has a strong link with poverty reduction, health, education and environmental condition (UN, 2002), it however noticed that most economic activities are not possible without mass increase in the use of energy (UN, 2005). Some of the new technological devices require energy for utilization. Most technicians and craft men abandon their work because the electrical energy supplied in the country is erratic, while some of them use diesel or petrol generating set, and this has drastically added to the cost of production. Those who could not produce became jobless. Transportation of any type also needs energy from fossil to generate mechanical energy of various proportions. Different establishments are looking for most profitable source of energy which

is environmental friendly, and also economical in approach, yet the range of price of crude oil products (diesel, petrol, kerosene, gasoline etc) is skyrocketing every day. Thus, this demands provision of stable, more reliable energy source and services as these directly determine the type of services to expect from other sectors i.e. production, manufacturing as well as the nation's economy (Sambo, 2006).

The effect of the quest to meet with modern technical development is discovered in the gradual wearing away of the forest as the population density of trees drastically reduced. This exposes the nation to global warming and storms such as tornado and tempest which causes great damage to buildings and various construction projects. Though energy is needed for survival, the country is suffering under energy poverty.

The country is not ready to shoulder the project and policy which will safeguard the country from environmental hazards. In 1979, under the regime

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of President Olusegun Obasanjo's Operation Feed the Nation, embargo was strictly laid on deforestation, and the then government subsidized the price of kerosene to the avoidable price so that the attention of the people was diverted from it. The government completely enforced afforestation. Green Revolution was the programme sponsored by President Shehu Shagari to redeem our nation from environmental hazards. But some of the leaders afterward, diverted their attention from that and failed to create alternative source of energy for the fast increasing population. The energy produced by crude oil within the first four years of 21st century, contributed at the average of about 72% to the federation account, 32% to the Gross Domestic Product (GDP), and 97% of the expected income in 1950s. The government research and investment have been majorly on oil sector, while energy produced from other sources has declined drastically (Samba, 2006).

Having discovered the environmental degeneration resulting from the consumption of oil product, the research of government is now focusing on the renewable energy source as the prices of fossil in the country escalate. Despite all the government efforts, the problems encountered are connected with poor record of research source, result, deficiency in planning and budgeting on energy. Also, projecting on how to improve on those sources available, appears impossible as a result of exploitation. Any available source by consumer for domestic and industrial purposes, is utilized. The purpose of this research is to study the structure of domestic energy consumption and its determination. When households climb the energy ladder, deforestation reduces as less of fire wood and charcoal are required. The indoor and outdoor pollutions that lead to respiratory acquired diseases, is reduced or eliminated with shift to move sophistication sources (M. Zhra, 2003). The sophistication of energy source has been considered as improvement of household's or/and country's welfare, aligned to other socio-welfare indicators

that have been used to measure the standard and quality of life (Beneger and Vendier-chaouchane, 2007). Energy poverty has been considered to undermine global development challenges including income poverty, climate change, food insecurity, healthy and education (Nussbaum et al, 2012). A number of approaches have been used in defining or establishing levels of energy poverty based on the energy expenditure as a proportion of household total expenditure. Under this measure, households spending more than 10% of other total expenditures on domestic energy used which is considered to survive energy poverty. Barnes et al, 2011 used energy demand, income and other factors in identifying the energy poverty line in Bangladesh and reported high consistence between the income and energy poverty. An increase in the proportion of households, using fire wood was prevented in Kano State ,Nigeria ,between 2002 and 2006 against the background of simply challenges for biomass sources of energy in the town's vicinity due to deforestation (Macon et al 2009). Although, the availability of wood is a factor significantly affecting the choice of energy which includes, cultural factor and cost of energy source, large member of people move into energy business due to shifting returns from other enterprise.

Study Area.

The study area is Saki which is the main focus of Oke-Ogun area for commercial, political activity and socio-economic activities. It is located in the old Oyo North of Oyo State, Nigeria. It is on the latitude 8.67^oN and 3.38^oE and 4571 meter elevated above sea level. It has about 178677 inhabitants according to 2006 population census. It is characterized with rocks, to mention but a few; Ologun, Asabari, Agara, etc. The average temperature of Saki is about 32^o C, and it is dominated by some hardwood such as annoyers, polymeric, deuterium, cobia, vortex, burlier aphelia (forestry report, 2014) Saki is known for farming and commercial both internal and external activities. It is called the food basket of Oyo State.

RESEARCH METHODOLOGY

The research was conducted under 190 structure questionnaires for 210 houses. Saki was studied under 5 zones based on the population density and brief information from PHCN distribution channel. The research tool was selected to guide and assist the respondents to fill the correct data because of some technicalities involved. The analysis after collection, showed effective members of 182, while the rest of 28 are defective. The research also related with the respondents, using personal interview to get the wastage of their electrical gadget. The research was done by converting charcoal measurement to standard measurement and an average wastage for various itezms of equipment got as energy, was calculated in mega Joule. The commutative analysis energy was done by the use of excel, base in copulated frailer for various energy source.

Table1: shows the outcome of the 210 structured questions.

Zone	No of Questionnaire Administered	No of Effective Response
A	40	33
B	50	47
C	30	27
D	30	27
E	60	51
TOTAL	210	182

Zone A	Challenge, Tiwadayo, Gedu, Orelope, and Moboluwaji
Zone B	Irewole, Ajegunle, Oke Alafia, and Oke Ayo
Zone C	Otun, Isale Ola, OkeAje, Igboro and Apinnite
Zone D	Sango, Opomalu, Kube, Mokola, Iya, Ijaleoda
Zone D	Abimbola layout, Medinat Area and Afote

DATA ANALYSIS

The percentage total responded to domestic energy from various sources shows that 20.61856% of total responded to electricity, 5.743741% to fuel wood, 5.301914s% to Liquefied Natural Gas (LNG),

19.1458026s% to petrol, 4.270986745% diesel 20.4712319 responded to kerosene 24.4477172% responded to charcoal and approximately 0% responded to solar. The table below shows the various energy sources and their household respondents.

Zone	No House	Electricity	Fuel	LNG	Petrol	Diesel	Kerosene	Charcoal	Solar
A	33	26	6	4	18	2	20	33	0
B	47	38	9	21	38	11	36	41	0
C	24	14	11	0	12	0	21	24	0
D	27	20	0	1	20	2	24	23	0
E	51	42	13	10	42	14	38	45	0
TOTAL	182	140	39	36	130	29	139	166	0

Electricity: The table shows that 140 houses which are equal to 76:92% of people use electricity for power of their electrical and electronic appliances. The highest electricity users are in zone B, due to the fact that the zone is a civilized community. But the least comes from zone C. This is due to the fact that the transformer of the area is not functioning properly especially at Otun, there was no power supply. As the people could not bear the exorbitant PHCN bill, their supply was disconnected.

Fuel wood: Fuel wood data shows 21.43% of the household amounts to 39 respondents use fuel wood which is as a result of poverty, and their accessibility. Some of the communities in this area which are close to bush, can easily get wood. The highest consumption is zone E and the lowest is zone D due to smoke affiliated and its set time. They use fuel wood for cooking and heating.

Liquated Natural Gas (LNG): 19.78% responded to LNG due to the fact that they consider cost to be too high. Some of the respondents are educated and rich. Some are afraid of its inflammation which may come from their carelessness or fr children. This also is used for cooking and heating.

Petrol: Petrol claims 71.43% as almost all the houses in Saki, are generating electricity power supply by themselves to power their modern electrical appliances and for lighting. This is due to

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irregular power supply by P H C N. Diesel responses show that 15.93% of respondents are using it for generating electricity for lighting and powering of electrical appliances. Few people responded to it due to the cost of procuring a generator because of the intense noise and air pollutant associated with it and the high cost of its fuel, ₦ 250 / liter. Kerosene claims 76.37% of the respondents as it is strictly used for cooking, heating and lightning. Some of the people that use kerosene are from Zone E.

Charcoal: The percentage that responded to charcoal was 91.21%, which are 166 out of the total respondents. Charcoal is used for cooking and heating. The response was due to unbearable cost as 1 bag (45 kg) is ₦1800.00 in Saki. Also, charcoal is pollutant free. Its accessibility and its availability made such a response possible.

Observation shows that 49.63181149% of the respondents venture into sources such as firewood, kerosene, and diesel, which are not friendly with environment in that they release huge amount of pollutants to the environment. The research shows that the financial capacity and education that something has to be done to energy source used. Educated people venture into the use of LGN, electricity and charcoal as supplements for cooking and heating. During the research, it was discovered that one of following factors affects the choice of energy source:

Education and Financial Impact on the Choice of Energy Source

The research shows that education and financial capacity have something to do with the choice of energy sources. The educationally and financially buoyant people use LNG, electricity, kerosene and charcoal for cooking and heating. Diesel and petrol for generating electricity from their generator set. The illiterate and poor people use kerosene, firewood and charcoal for cooking and heating. Kerosene is their major source of lighting as long as electric power supply is not available. Some derive their lighting energy from

primary cell in form of battery and electric lamp and touch lighting.

Fastness and Pollutant free: Those who chose the use of LNG claimed its fastness and it is free from smoke although they are financially buoyant. Likewise the average class of the people who use charcoal also claimed their choice is based on its smoke free and its speed of combination when compared to other sources: firewood and kerosene which were not preferred much because they are associated with smoke. They also preferred generator for lighting because of its reliability and its availability though it is costly when compacted to electricity power supply.

Neatness and availability: Many diverted from kerosene because of the smoke produced and the stress involves in scratching and washing their pot. Those that used LNG claimed its neatness i.e. there were no stain of smoke. The availability and ability determined the type to be used. It was observed that people in Otun, Kinikini, Ogidigbo, Oge, subscribed much for fire wood because some of those places are close to the bush; the power supply is erratic, and the women are aged and illiterate. Sometimes, they couple the use of fuel wood with coal for heating and cooking, while the kerosene is the major source of lighting except the few who are financially buoyant, those are using small tiger generator for lighting to power their electrical gadgets.

Age and Marital Status

The use of fuel wood is very rampant among the aged woman whose age varies from 45years and above. Some of them are widows or divorcees, while most of the women below age 45 prefer the use of charcoal and kerosene for heating and lighting. Although, very few use electricity when available, but their claim is that it is not always as fast as other sources. Only a few women especially students of higher institution of leaning in zone1 (Challenge, Tiwadayo, Gedu, Ore lope Mobalaji etc).

Cost Per Purchase and Availability.

As one liter of kerosene costs ₦260.00, 1kg of charcoal cost #1700.00, 1kg LNG cost #340.00 one liter of diesel costs ₦270.00, and that of fuel wood is not actually free; people preferred going for low cost source for heating and cooking, and sometimes back it up with kerosene. Poor people use fuel wood for heating and cooking and kerosene, Shea butter, palm oil for lighting since they are much available. LNG appears to be more costly used mostly by high rank civil servants. They also use either diesel or petrol generator for lighting and powering of their gadgets.

CONCLUSION

The analysis shows that the major sources of energy in Saki are biomass (charcoal and fuel wood) for cooking and heating. The illiterate who are aged women, divorcee and poor people, mostly depend on the biomass while electricity source which is commonly used by students who can wait four hours for their food to be cooked. Other literates who have electrical heating appliances cannot use them because of erratic power supply and high cost of power supply at Saki, coupled with high monthly PHCN bill.

Finally huge amount of cooking energy is from charcoal for cooking and heating. Electricity is for entertainment and lighting. Some energy obtained from kerosene is for lighting and heating while cooking gas is for cooking and heating.

RECOMMENDATIONS

From the result it is obvious that government should protect our vegetation against desertification by supplying much of the LNG to the region at a lower and avoidable cost. I also recommend that government should use the obtained result to calculate energy needed by the area to improve the electric power supplies to the area. The price of

LNG should be reduced to avoidable cost in order to rescue the region from desertification as it may result to constant deforestation.

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